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Terms: **patno=5929466** (Edit Search)

Pat. No. 5929466, *

5,929,466

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Jul. 27, 1999

Semiconductor device and method of fabricating the same

REISSUE: Reissue Application filed Jul. 27, 2001 (O.G. Dec. 18, 2001) Ex. Gp.: 2815; Re.
S.N. 09/915,710

INVENTOR: Ohba, Yasuo, Yokohama, Japan
Hatano, Ako, Tokyo, Japan

ASSIGNEE-AT-ISSUE: Kabushiki Kaisha Toshiba, Kawasaki, Japan (03)

APPL-NO: 874,299

FILED: Jun. 13, 1997

FOR-PRIOR:

Mar. 9, 1994 Japan 6-038157
Jan. 6, 1995 Japan 7-000704

REL-US-DATA:

Continuation of Ser. No. 400,865, Mar. 8, 1995 now patented 5,656,832

INT-CL: [6] H01L 33#00; H01L 31#030.4; H01L 29#205

US-CL: 257#103; 257#96; 257#97; 257#190

CL: 257

SEARCH-FLD: 257#103, 96, 97, 190

REF-CITED:

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5,218,216	6/1993 * Manabe et al.	257#64
5,247,533	9/1993 * Okazaki et al.	257#103
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2-229476	9/1990 * Japan	257#103
4-297023	10/1992 * Japan	257#103
5-183189	7/1993 * Japan	257#103

PRIM-EXMR: Jackson, Jr., Jerome

LEGAL-REP: Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

2/25/02 4:36 PM



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2/25/02 us 5929466 09/915710

Selected file: PLUSPAT

Search statement 2

?us5929466/pn

** SS 2: Results 1

Search statement 3

?prt fu legalall max

1/1 PLUSPAT - (C) QUESTEL-ORBIT- image

CPIM (C) Questel-Orbit

PN - US5929466 A 19990727 [US5929466]

TI - (A) Semiconductor device and method of fabricating the same

PA - (A) TOKYO SHIBAURA ELECTRIC CO (JP)

IN - (A) HATANO AKO (JP); OHBA YASUO (JP)

AP - US87429997 19970613 [1997US-0874299]

PR - US87429997 19970613 [1997US-0874299]

- JP3815794 19940309 [1994JP-0038157]

- JP70495 19950106 [1995JP-0000704]

- US40086595 19950308 [1995US-0400865]

IC - (A) H01L-029/205 H01L-031/0304 H01L-033/00

EC - H01L-029/201

- H01L-029/205

- H01L-033/00C4D6C2

- H01L-033/00G3B2

- H01S-005/323B4

ICO - T01S-005/02H2

- T01S-005/042E

PCL - ORIGINAL (O) : 257103000; CROSS-REFERENCE (X) : 257096000 257097000
257190000

DT - Corresponding document

CT - US5218216; US5247533; US5523589; US5578839; JP2-229476; JP4-297023;
JP5-183189

STG - (A) United States patent

AB - A semiconductor device comprises a single crystal substrate, a nucleus formation buffer layer formed on the single crystal substrate, and a lamination layer including a plurality of $\text{Al}_{1-x-y}\text{Ga}_x\text{In}_y\text{N}$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x+y \leq 1$) layers laminated above the nucleus formation buffer layer. The nucleus formation buffer layer is formed of $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$ ($0 \leq s \leq 1$, $0 \leq t \leq 1$, $s+t \leq 1$) and is formed on a surface of the substrate such that the nucleus formation buffer layer has a number of pinholes for control of polarity and formation of nuclei. A method of fabricating a semiconductor device comprises the steps of: forming, above an $\text{Al}_{1-x-y}\text{Ga}_x\text{In}_y\text{N}$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x+y \leq 1$) semiconductor layer doped with a p-type dopant, a cap layer for preventing evaporation of a constituent element of the semiconductor layer, the cap layer being formed of one of AlN in which a p-type dopant is added and Al_2O_3 , subjecting the semiconductor layer to heat treatment, and removing at least a part of the cap layer.

1/1 LGST - (C) LEGSTAT

PN - US 5929466 [US5929466]

2/25/02 us 5929466 09/915710

AP - US 874299/97 19970613 [1997US-0874299]
DT - US-P
ACT - 19970613 US/AE-A
APPLICATION DATA (PATENT)
{US 874299/97 19970613 [1997US-0874299]}
- 19990727 US/A
PATENT
- 20011218 US/RF
REISSUE APPLICATION FILED
20010727
UP - 2001-51

1/1 CRXX - (C) CLAIMS/RRX
AN - 3176221
PN - 5,929,466 A 19990727 [US5929466]
PA - Toshiba Corp JP
PT - CE (Chemical Electrical)
ACT - 20010727 REISSUE REQUESTED
ISSUE DATE OF O.G.: 20011218
REISSUE REQUEST NUMBER: 09/915710
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 2815

Reissue Patent Number:

UP - 2001-51
UACT- 2001-12-18

1/1 PAST - (C) PAST
AN - 200151-001653
PN - 5929466 A [US5929466]
DT - A (UTILITY)
OG - 2001-12-18
CO - REA
ACT - REISSUE APPLICATION FILED
SH - REISSUE APPLICATION FILED

Search statement 3

?file inpadoc

Selected file: INPADOC

Search statement 2

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1 Patent Groups
** SS 2: Results 5

Search statement 3

?famstate nonstop

1/5 INPADOC - (C) INPADOC
PN - JP 7249795 A2 19950926 [JP07249795]
TI - SEMICONDUCTOR DEVICE
IN - OBA YASUO; HATANO GOKOU
PA - TOKYO SHIBAURA ELECTRIC CO
AP - JP 38157/94-A 19940309 [1994JP-0038157]
PR - JP 38157/94-A 19940309 [1994JP-0038157]
IC - H01L-033/00

2/5 INPADOC - (C) INPADOC
PN - JP 8186332 A2 19960716 [JP08186332]
TI - MANUFACTURE OF SEMICONDUCTOR ELEMENT
IN - HATANO GOKOU; OBA YASUO
PA - TOKYO SHIBAURA ELECTRIC CO
AP - JP 704/95-A 19950106 [1995JP-0000704]
PR - JP 704/95-A 19950106 [1995JP-0000704]
IC - H01S-003/18; H01L-021/205; H01L-033/00

3/5 INPADOC - (C) INPADOC
PN - US 5656832 A 19970812 [US5656832]
TI - SEMICONDUCTOR HETEROJUNCTION DEVICE WITH ALN BUFFER LAYER OF 3NM-10NM
AVERAGE FILM THICKNESS
IN - OHBA YASUO [JP]; HATANO AKO [JP]
PA - TOKYO SHIBAURA ELECTRIC CO [JP]
AP - US 400865/95-A 19950308 [1995US-0400865]
PR - JP 38157/94-A 19940309 [1994JP-0038157]
- JP 704/95-A 19950106 [1995JP-0000704]
IC - H01L-029/205; H01L-027/15; H01S-003/19

1/1 LEGALI - (C) LEGSTAT
PN - US 5656832 [US5656832]
AP - US 400865/95 19950308 [1995US-0400865]
DT - US-P
ACTE- 19950308 US/AE-A
APPLICATION DATA (PATENT)
{US 400865/95 19950308 [1995US-0400865]}
- 19950501 US/AS02
ASSIGNMENT OF ASSIGNOR'S INTEREST
KABUSHIKI KAISHA TOSHIBA 72 HORIKAWA-CHO, SAIWAI-KU KAWASAKI-SHI,
JAPAN * OHBA, YASUO : 19950405; HATANO, AKO : 19950405
- 19970812 US/A
PATENT
UP - 1999-19

4/5 INPADOC - (C) INPADOC
PN - US 5909040 A 19990601 [US5909040]
TI - SEMICONDUCTOR DEVICE INCLUDING QUATERNARY BUFFER LAYER WITH PINHOLES
IN - OHBA YASUO [JP]; HATANO AKO [JP]
PA - TOKYO SHIBAURA ELECTRIC CO [JP]
AP - US 866056/97-A 19970530 [1997US-0866056]
PR - US 866056/97-A 19970530 [1997US-0866056]
- JP 38157/94-A 19940309 [1994JP-0038157]
- JP 704/95-A 19950106 [1995JP-0000704]
- US 400865/95-A2 19950308 [1995US-0400865]

2/25/02 us 5929466 09/915710

IC - H01L-033/00; H01L-031/0304

1/1 LEGALI - (C) LEGSTAT

PN - US 5909040 [US5909040]

AP - US 866056/97 19970530 [1997US-0866056]

DT - US-P

ACTE- 19970530 US/AE-A

APPLICATION DATA (PATENT)

{US 866056/97 19970530 [1997US-0866056]}

- 19970530 US/AS02

ASSIGNMENT OF ASSIGNOR'S INTEREST

KABUSHIKI KAISHA TOSHIBA 72 HORIKAWA-CHO, SAIWAI-KU KAWASAKI-SHI,
JAPAN * OHBA, YASUO : 19970521; HATANO, AKO : 19970521

- 19990601 US/A

PATENT

UP - 2000-05

5/5 INPADOC - (C) INPADOC

PN - US 5929466 A 19990727 [US5929466]

TI - SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING THE SAME

IN - OHBA YASUO [JP]; HATANO AKO [JP]

PA - TOKYO SHIBAURA ELECTRIC CO [JP]

AP - US 874299/97-A 19970613 [1997US-0874299]

PR - US 874299/97-A 19970613 [1997US-0874299]

- JP 38157/94-A 19940309 [1994JP-0038157]

- JP 704/95-A 19950106 [1995JP-0000704]

- US 400865/95-A1 19950308 [1995US-0400865]

IC - H01L-033/00; H01L-031/0304; H01L-029/205

1/1 LEGALI - (C) LEGSTAT

PN - US 5929466 [US5929466]

AP - US 874299/97 19970613 [1997US-0874299]

DT - US-P

ACTE- 19970613 US/AE-A

APPLICATION DATA (PATENT)

{US 874299/97 19970613 [1997US-0874299]}

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- 20011218 US/RF

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20010727

UP - 2001-51

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